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## New, Revived, and Reallocated Names for North American Whiptailed Lizards, Genus *Cnemidophorus*\*

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During the past two years, at various intervals as time and circumstances permitted, material has been gathered and studies made upon various problems involving the taxonomy of certain species and subspecies of *Cnemidophorus* of the United States and adjacent Mexico. A complete synopsis of the forms in the United States is planned, but a number of problems that yet remain prevent presentation of the entire survey at the present time. Nevertheless the proper nomenclature of the forms to be treated that do occur in Mexico seems clearly indicated by the work so far accomplished. At the request of Dr. Hobart M. Smith, skeleton treatments of the Mexican forms involved in my own study are presented in this preliminary paper, in order that the names be made available for Smith and Taylor's checklist of Mexican lizards now in press. I take this opportunity to add diagnoses of some other forms which occur only in the United States. The only species or subspecies of this country currently recognized and not treated herein are *C. hyperythrus beldingi* Stejneger, 1894, *C. sackii gularis* Baird and Girard, 1852, *C. sexlineatus* (Linnaeus), 1766, and *C. tessellatus* (Say, in James), 1823.

Inasmuch as this is a preliminary paper, detailed acknowledgements of the assistance received from friends, associates, and acquaintances are postponed for the final account. For the present I express to each, unnamed, my profound gratitude for his cooperation and advice. However, a special note of thanks is due Dr. Hobart M. Smith for his assistance throughout the study. Specimens are mentioned from the Chicago Academy of Sciences (CA), Chicago Natural History Museum (CNHM), Hensley-Burger Collection (H-B), Museum of Comparative Zoology (MCZ), University of Colorado Museum (UCM), University of Illinois Natural History Museum (UI), University of Michigan Museum of Zoology (UMMZ), and United States National Museum (USNM).

\*Contribution from the University of Illinois Museum of Natural History.

*Cnemidophorus gadovi*\* new species

Among the specimens in the United States National Museum formerly identified as *Cnemidophorus sexlineatus perplexus* is a slightly mutilated specimen from Hermosillo, Sonora, Mexico, USNM 40042, which seems to represent a species distinct from any yet described. As indicated in the following diagnosis this new species is very similar to *C. labialis* from which it diverges mostly in the direction of *C. inornatus*.

*Diagnosis.* This species agrees with *C. labialis* and differs from other species in having (1) postantebrachials approximately four times the size of adjacent scales, (2) twelve scales separating the paravertebral light stripes, (3) ventrum light and unmarked in preservation, and (4) the anterior nasal in broad contact with the second upper labial. It differs from *C. labialis* in the following characters: (1) femoral pores 19 to 20, (2) supraocular granules extending approximately to the midpoint of the lateral border of the frontoparietal, and (3) superciliary granules extending in two rows to the second supraocular suture and in one row to the first supraocular suture.

*Discussion.* The specimen indicated above, hereby designated the holotype, is the only definitely known example of the species. However, the "juvenile" cotype of *C. tigris aethiops* with eggs, mentioned by both Cope (1900, p. 583) and Burt (1931, p. 160) is probably also an example of *gadovi*. The apparent absence of specimens of this species from collections is not surprising when one considers the former misidentification of both above mentioned specimens. The coloration of *gadovi* is strikingly like that of juveniles of both *C. sackii stictogrammus* and *C. tigris aethiops*; re-examination of series of juveniles of the last two subspecies may reveal additional specimens of the first.

Although *C. gadovi* is somewhat annectant between *C. labialis* and *C. inornatus*, it does not entirely bridge the morphological or geographic gaps between them. Specimens from the large areas separating the presently known ranges of the three forms will be necessary to indicate which, if any, are conspecific.

*Cnemidophorus inornatus* Baird

*Cnemidophorus inornatus* Baird, Proc. Acad. Nat. Sci. Philadelphia, vol. 10, 1859, p. 255. Holotype, USNM 3022a; type locality, Pesqueria Grande, Nuevo Leon, Mexico.

Burt (*op. cit.*) assigned records, specimens, and synonymous names of the little spotted whiptail partly to one and partly to the other of the two he

\*Named for Hans Gadow in recognition of his excellent pioneer revisionary studies of *Cnemidophorus*.

called *C. sexlineatus gularis* and *C. sexlineatus perplexus*. When Schmidt and Smith (1944) distinguished the two species confused by Burt, they unfortunately used the name *perplexus* for the little striped whiptail. As will be discussed presently, the holotype of *perplexus* (USNM 3060) represents a member of the *tesselatus* group with small postantibrachials and small mesoptichials. Of the two available names, *inornatus* and *octolineatus* (both proposed by Baird, 1859), the former seems preferable since the name *octolineatus* has long been associated with a race of another species.

*Diagnosis.* The character of the postantibrachials, which are enlarged but seldom more than four times the size of adjacent scales, distinguishes *C. inornatus* from the various subspecies of *C. sackii* with which it occurs. In addition, the coloration is distinctive as follows: (1) six to eight light stripes equally spaced, three on each side of the middorsal area which usually has one, but which may have two light stripes (extreme southeast) or no light stripes (extreme northwest); (2) paravertebral light stripes usually separated by 9 to 13 scales at midbody; (3) dark fields (i.e., the dark areas between the light stripes) without any sign of light spots, and (4) tail, toe tips, and ventrum, especially chin, light blue. The blue color is frequently lost in preservation.

*Discussion.* The type description of *velox* (Springer, 1928) was evidently based on populations of both *C. inornatus* and *C. sackii innotatus*. Three specimens were mentioned by Springer (*op. cit.*) of which one was spoken of as *the* type by Burt (1931, p. 127). This specimen, now MCZ 37208, is lecto-holotype by Burt's designation. It is an example of *C. inornatus*.

*Distribution.* Western Texas, most of New Mexico, southeastern Arizona, and north-central Mexico.

#### *Cnemidophorus perplexus* Baird and Girard

*Cnemidophorus perplexus* Baird and Girard, Proc. Acad. Nat. Sci., Philadelphia, 1852, p. 128. Holotype, USNM 3060; type locality, "Valley of the Rio San Pedro of the Rio Grande del Norte."

Allocation of the name *perplexus* remains somewhat problematical. The holotype (USNM 3060) is, as Cope (1892) depicted it, a specimen with small postantibrachials and small mesoptichials, which definitely place it in the *tesselatus* group. The combination of distinct light stripes, separated by unbroken and unspotted dark fields, and immaculate white ventrum in such a large specimen (91 mm. snout to vent) is quite distinctive, not even approaching the coloration of any other species or subspecies of the *tesselatus* group.

The type specimen was collected by Dr. William Gambel on his last journey to California, but exactly where is not indicated. Another specimen *of perplexus* collected by Gambel, USNM 30885, is also without definite

locality data. Cope (1900) may have been correct in stating that *perplexus* occurs in the valley of the Rio Grande. Several unidentified specimens from southeastern Texas, seen in the early part of this study, may well represent the species. The present use of the name *perplexus* for a lizard inhabiting the Rio Grande Valley poses many questions which must pass unanswered until specimens with definite locality data are seen.

*Cnemidophorus sackii innotatus*\* new subspecies

Springer (1928) may have had specimens of this lizard on hand when he described *velox*; in some respects his description fits it better than *inornatus*. However, the cotype to which Burt (1931, p. 128) restricted the name is a specimen of *inornatus*. No definite recognition seems ever to have been given the striking difference between this subspecies and the better known *stictogrammus*. UMMZ 73323c, an adult from the "vicinity" of Kanab, Kane County, Utah, is hereby designated holotype of the new subspecies.

*Diagnosis.* *C. sackii innotatus* may be briefly characterized as follows: (1) seven light stripes of which the middorsal is darker and less distinct than the others; (2) 8 to 11 scales separating the paravertebral light stripes at midbody; (3) dark fields distinct and unspotted; (4) dark fields extending to area above hind legs; (5) ventrum immaculate white in juveniles and adults of both sexes; (6) frenocular separated from the loreal by the upper preocular which extends undivided to the supralabials.

*Distribution.* Colorado Plateau including southern Utah, southeastern Colorado, northern Arizona, and northern New Mexico.

*Cnemidophorus sackii semifasciatus* Cope

*Cnemidophorus gularis semifasciatus* Cope, Trans. Amer. Philos. Soc., vol. 17, 1892, p. 49. Holotype, USNM 9248; type locality, Agua Nueva, Coahuila, Mexico.

As recognized by Cope (1892) specimens from the Big Bend area of Texas and adjacent Mexico are conspicuously different from the other subspecies of *C. sackii* of the United States. In coloration the Big Bend lizard resembles more closely the subspecies inhabiting western Coahuila and Chihuahua, namely *scalaris*.

Two names are available for the Big Bend subspecies, both presented by Cope (1892) in the same publication. *Cnemidophorus septemvittatus* was described first (p. 40) from a specimen said to be from Eldorado County, California; *C. gularis semifasciatus* was described on page 49 from a specimen from Agua Nueva, Coahuila, Mexico. As Burt (1931) pointed out, the locality

\*Referring to the unspotted condition of the dark fields between light stripes, which is distinctive of the subspecies.

data for the holotype of *septemvittatus* is obviously erroneous, so it seems preferable to disregard page priority and to select the name *semifasciatus* which is based on a specimen, USNM 9248, with definite and feasible locality data.

*Diagnosis.* *C. sackii semifasciatus* differs from *sackii stictogrammus* and *sackii innotatus* in only a few respects: (1) dark fields represented by seven narrow black stripes which may break up posteriorly into rows of spots, (2) mid-dorsal dark field terminating at a point about two-thirds of the distance from the front to the hind leg insertion, (3) chin white with small black spots, (4) frenocular not in contact with loreal. *C. sackii semifasciatus* may be distinguished from *sackii scalaris* by the first two above features.

*Distribution.* The Big Bend area of Texas, the adjacent portion of Coahuila, and probably northeastern Chihuahua.

#### *Cnemidophorus sackii stictogrammus*\* new subspecies

As discussed under the respective forms, the various names which have been used for the western subspecies of *C. sackii* all apply to other species and subspecies: *octolineatus* and *velox* to *C. inornatus*, *septemvittatus* to *C. sackii semifasciatus*, and *perplexus* to a member of the *tesselatus* group. I propose that the western spotted whiptail be called *stictogrammus*. Hensley-Burger 768, an adult female from Yank Springs, 6 miles southeast of Ruby, Santa Cruz County, Arizona, is hereby designated as holotype. † Ten topotypic specimens, CA 15683-4 and UI 15100-7 may be considered paratypes.

*Diagnosis.* *C. sackii stictogrammus* may be distinguished from the other subspecies of *C. sackii* by the following characteristics: (1) middorsal light stripe usually lacking, consequently distance between the two paravertebral light stripes usually narrower than that between paravertebral and dorsolateral light stripe on each side; (2) four to six scales separating paravertebral light stripes at midbody; (3) dark fields usually with well developed light spots in adults; (4) dark fields extending to area above insertion of hind legs; (5) ventrum immaculate white in juveniles and adults of both sexes; (6) frenocular not in contact with loreal. The coloration of occasional large specimens is very aberrant, predominantly black above with rows of light spots.

*Distribution.* Western tip of Trans-Pecos Texas, southern New Mexico, southern Arizona exclusive of the southwestern corner, and northwestern Mexico.

\*Referring to the typical dorsal pattern of alternating longitudinal rows of light spots and light stripes.

†This specimen has been deposited in the United States National Museum.

***Cnemidophorus tigris aethiops* Cope**

*Cnemidophorus tessellatus aethiops* Cope, Ann. Rep. U. S. Nat. Mus. for 1898, 1900, p. 582. Lectoholotype, USNM 64246; type locality, Hermosillo, Sonora, Mexico.

In the most recent reference to the subspecies of *C. tigris* (Smith and Burger, 1949) only three geographic races were listed with ranges outside of Baja California. Data representing series of desert whiptails from localities scattered throughout the range of the species indicate that at least seven subspecies are represented on the mainland of North America. They are easily distinguished on the basis of coloration alone. In addition, there are a few correlated differences in scutellation which suggest that the differences are not merely phenotypic as Burt (1931) supposed. Preliminary diagnoses of these subspecies are given below.

As previously noted, the smallest of the six cotypes of *aethiops* represents a different species than do the other five. To avoid possible confusion one of the last, USNM 64246, is hereby designated lectoholotype.

**Diagnosis.** *C. tigris aethiops* differs from the other subspecies of *C. tigris* in the following features of adult coloration: (1) middorsal and dorsolateral dark fields unbroken and distinctly wider than the light stripes; (2) two light stripes on each side, the paravertebral and the dorsolateral, uninterrupted; the third, the lateral, more or less obscured by vertical barring; (3) chin, throat, and usually the lower labials and the anterior two-thirds of the belly black. A second row of superciliary granules is usually present and the supraocular granules usually extend at least to the posterior border of the frontal.

**Distribution.** Southern half of Sonora eastward to the Sierra Madre Occidental.

***Cnemidophorus tigris gracilis* Baird and Girard**

*Cnemidophorus gracilis* Baird and Girard, Proc. Acad. Nat. Sci. Philadelphia, 1852, p. 128. Holotype, USNM 3034; type locality, restricted to Yuma, Yuma County, Arizona.

**Diagnosis.** Distinctive in the following features of adult coloration: (1) four distinct light brown stripes, which are usually as wide as the dark fields, and an additional lateral stripe on each side, which is lighter or encloses lighter spots; (2) dark fields restricted to zig-zag lines or irregularly broken into rows of dark spots. Some portion of a second row of superciliary granules is usually present. The supraocular granules extend to, or almost to, the frontal.

**Distribution.** The southern half of Arizona (south of the Colorado Plateau) and southern New Mexico west of the Rio Grande south into northern Sonora and northwestern Chihuahua.

*Cnemidophorus tigris marmoratus* Baird and Girard

*Cnemidophorus marmoratus* Baird and Girard, Proc. Acad. Nat. Sci. Philadelphia, 1852, p. 128. Lectoholotype, USNM 3024a; type locality, restricted to El Paso, El Paso County, Texas.

*Diagnosis.* Distinctive in the following characters: (1) dorsal coloration consisting of a more or less bold reticulum with several broken light stripes usually evident middorsally and with vertical bars frequently accentuated on the sides; (2) chin white or greyish white with black spots; (3) belly white, checkered anteriorly with gray and black. The superciliary granules usually extend in two rows to the second and in one row to the first supraocular suture. The supraocular granules usually extend to the posterior border of the frontal.

*Distribution.* Southern New Mexico east of the Rio Grande and Trans-Pecos Texas south into eastern Chihuahua, western Coahuila, and northeastern Durango.

*Cnemidophorus tigris multiscutatus* Cope

*Cnemidophorus tessellatus multiscutatus* Cope, Trans. Amer. Philos. Soc., vol. 17, 1892, p. 38. Lectoholotype, USNM 15160; type locality, Cerros Island, west coast of Baja California, Mexico.

*Diagnosis.* Distinctive as follows: (1) middorsal dark field or row of spots distinctly wider than the paravertebral light stripes, (2) usually less than eight light stripes evident on posterior part of body, and (3) chin white with black spots or bars covering an average of more than five scales.

*Distribution.* Los Angeles area in California southward on the Pacific coast of Baja California to beyond Sebastian Vizcaino Bay.

*Cnemidophorus tigris mundus* Camp

*Cnemidophorus tigris mundus* Camp, Univ. Calif. Publ. Zool., vol. 17, 1916, p. 71. Lectoholotype, USNM 3040; type locality, corrected to Fort Miller, Fresno County, California.

*Diagnosis.* Differs from the other subspecies of *C tigris* in the following features of adult coloration: (1) middorsal dark field or row of spots distinctly wider than the paravertebral light stripes, (2) usually eight or more light stripes posteriorly, and (3) chin immaculate white or white with small black spots covering an average of five or less scales. *C tigris mundus* resembles *C. tigris multiscutatus* in usually having a second row of superciliary granules and in having supraocular granules extending approximately to the midpoint of the lateral edge of the frontoparietals.

*Distribution.* Northern California west of the Sierra Nevada and south at least to Point Conception, Santa Barbara County.

***Cnemidophorus tigris septentrionalis* new subspecies**

A subadult female from Una, Garfield County, Colorado, CNHM 38217, is hereby designated holotype of the Colorado Plateau subspecies of *C. tigris*. It is fairly typical in both scutellation and coloration, though not showing the extreme fading notable in the posterior part of the dorsal color pattern of larger specimens.

*Diagnosis.* Very much like *gracilis* in dorsal pattern but (1) dorsal light stripes yellow rather than brown, (2) dark fields terminating well short of the area above hind legs, and (3) chin is usually white with small black spots. The arrangement of superciliary and supraocular granules is similar to that of *gracilis*. However, an accessory anterior supraocular is usually present, and the first supraocular is usually separated to some extent from the second supraocular by a row of granules.

*Distribution.* Colorado Plateau including the northern half of Arizona, the northwestern quarter of New Mexico, the southeastern half of Utah, and the southern quarter of Colorado.

***Cnemidophorus tigris tigris* Baird and Girard**

*Cnemidophorus tigris* Baird and Girard, Proc. Acad. Nat. Sci., Philadelphia, 1852, p. 69. Holotype, USNM 4103; type locality, Great Salt Lake, Salt Lake County, Utah.

*Diagnosis.* Distinctive in the following features of adult coloration: (1) four distinct light stripes separated by rows of dark spots on back, and a reticulum accentuated into vertical bars on sides, (2) chin white mottled with gray and occasionally spotted with black, (3) belly white checkered with gray and black especially anteriorly. The superciliaries are usually in one row throughout. The supraocular granules usually extend beyond the midpoint of the frontoparietal but seldom much beyond the posterior border of the frontal.

*Distribution.* Great Basin north and west of the Colorado Plateau west to the Sierra Nevada and north to southeastern Oregon and southern Idaho.



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